



NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

MBA PROFESSIONAL REPORT

**The Development of a Logistical Body of Knowledge for the
Department of Defense**

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December 2006**

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REPORT DOCUMENTATION PAGE			<i>Form Approved OMB No. 0704-0188</i>	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503.				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE December 2006	3. REPORT TYPE AND DATES COVERED MBA Professional Report	
4. TITLE AND SUBTITLE: The Development of a Logistical Body of Knowledge for the Department of Defense			5. FUNDING NUMBERS	
6. AUTHOR(S) Thomas E. Yardley, David E. Pavlik, and Gregory A. Curl				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A			10. SPONSORING / MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES The views expressed in this report are those of the author(s) and do not reflect the official policy or position of the Department of Defense or the U.S. Government.				
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.			12b. DISTRIBUTION CODE A	
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14. SUBJECT TERMS Logistics Operations, Asset Visibility, Supply Chain Management			15. NUMBER OF PAGES 45	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT UL	

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**THE DEVELOPMENT OF A LOGISTICAL BODY OF KNOWLEDGE FOR THE
DEPARTMENT OF DEFENSE**

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MASTERS OF BUSINESS ADMINISTRATION

from the

**NAVAL POSTGRADUATE SCHOOL
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I. INTRODUCTION

Students are often presented with new topics and concepts that require further research and enlightenment in order to be fully understood. As one progresses through higher levels of academia this additional study is considered more of a necessity. It should be understood though that a firm foundation of materiel to build upon is of the utmost importance. Due to the high variance of educational levels, professional concentrations and personal experiences, gaining this foundation to build upon may often be quite difficult.

Recognizing these factors, the following is submitted for consideration: A base of knowledge regarding logistical and supply chain management principles will create a more level playing field among users both familiar and unfamiliar with such concepts. There will always be subject matter “experts,” but in the modern, challenging world that the Department of Defense (DoD) operates, those at the operational levels should have a tool available to glean an understanding of necessary concepts regarding their logistical needs.

The purpose of this MBA Project is to identify, and provide, a basic but comprehensive overview of current logistical and supply chain management practices relevant to the DoD. By examining logistics culture from multiple, and potentially differing perspectives, we can generate a useful tool providing a standardized level of knowledge that encompasses logistical theories and prevalent qualitative decision-making tools

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II. METHODOLOGY

This project was conducted with the assistance of Naval Postgraduate School professors versed in Transportation, Logistical, and Financial Management disciplines. Presented in an annotated bibliography format, the project identifies key concepts, theories, articles, journals, and perspectives that will be useful to all DoD users. There are five main themes presented in the project that cover what is believed to be the most major themes of interest to the reader. These are:

- A historical discussion of major military transportation and logistical events including the Mexican / American War, the American Civil War, Campaigns of World War II, the Berlin Airlift and Operation Desert Storm 1991.
- Concise analysis of concepts, processes, and methods of strategic planning and execution.
- Logistics influence in requirements, development, contracting, test and evaluation, reliability and maintainability as well as communications, emphasizing aggressive proactive techniques to ensure maximum logistics influence on major weapon systems acquisition as well as optimum life-cycle management of fielded systems.
- Integration of financial management considerations of logistics including a look at the driving forces, Working Capital Funds (WCF), and other examples of applicable existing DoD and commercial financial processes.

Research for this project was conducted by exploring both general and specialized supply chain and logistical principles via published works. Articles and papers from recognized professional publications, subject matter books, and historic military perspectives were all recapitulated into the annotated bibliography that appears later in this document. Although there are literally thousands upon thousands of articles and references dealing with our chosen subject matter, those cited are believed to be a useful exposure to those not entirely familiar with current logistic-centric methodologies and issues. It is important to remember as well, this project is considered to be a “working

document,” in that future users can add to the provided pool of knowledge as new developments, technologies, and DoD procedures display increased prevalence.

III. MILITARY LOGISTICS, A HISTORICAL PERSPECTIVE

Why study and take lessons learned from the past? It is often stated that by not understanding our history, it is impossible to learn how to handle what comes in the future. Another way to consider this is by not recognizing our errors and triumphs; it is unlikely that we will have similar successes while repeating the same errors. There can be no doubt whether lessons from military logistics can be applied in the same way.

Throughout recorded history, armies have traveled to distant lands attempting to achieve a variety of objectives; be it political, religious, economical, or otherwise. During these times, be it the march of Hannibal and his elephant trucks or Sherman's March to the Sea during the Civil War, the importance of sound logistics was shown time and time again. This importance can be considered twofold in that Commanding Officers must not only be concerned with their own supply systems, but appreciative that it is quite often advantageous to deny the enemy access to their own resources.

During the Civil War, logistics were undoubtedly a deciding factor in the South's eventual defeat. A comparative lack of suitable infrastructure with limited geographic locations where food and supplies could be produced and stored created severe disadvantages for the Confederacy. Also logistical mismanagement and faulty methods created more problems. It was common for field commanders to order captured enemy infrastructure and supplies destroyed instead of incorporating the items for their own benefit. Multiple rail lines, as well as their associated pieces of rolling stock and locomotives, were merely cast aside. Also, the Confederacy had a serious lack of facilities and trained mechanics to repair wagons, railcars, and locomotives. As soldiers used and abused these items, their mission capability sorely suffered. This lack of capability not only limited expedient troop movements, but also the support needed to sustain their operations in forward areas.

As technology evolved mass armies and principles of war, technology began a lasting impact on logistics practices. War was quickly becoming a battle of supply and communication lines. Wartime munitions production output of German guns, small arms

and ammunition was nearly as large as or larger than American production suggesting Germany could produce the goods, but could not provide materiel to the front¹. The blunder of the German conquest was the rapid expansion of the Third Reich. After engulfing the substantial industrial resources of France, Czechoslovakia, and western Poland, Germany did not economize these resources². The Axis power had made a fundamental mistake of overextending fronts and supply lines. Conversely, the Allied powers made use of the exposed weakness by leveraging Hitler's mismanagement of the control and flow of goods and resources. The improvement in military effectiveness essentially became the economizing of Allied production capabilities.

Some may argue that logistics alone did not win the war, but the reality of Germany's famous mobile forces disagrees. Though technology of World War II (WWII) played a crucial role in shaping the focus and conclusion of the war, Axis powers did not exploit the opportunities it provided. Germany's scientists produced rockets, jets, and submarines that waged terror on Allied powers early in the war; however, they failed to build simpler trucks and jeeps needed to keep her armies on the move. By 1944, American and British forces were fully motorized, but the German army was still using one and a quarter million horses³. When Hitler's massive invasion force was poised on the border of the Soviet Union in 1941, it deployed with 3,350 tanks and 650,000 horses⁴. The sheer mass of the army is frightening; of course feeding the army and its supporting mechanisms was far more terrifying for the logistician. As the contest progressed to the elementary principle of moving goods, the Axis errors became a front to defend instead of leverage to victory. The ultimate defeat of Germany was rooted in logistics, but similar, seemingly fundamental, mistakes brought about the collapse of the whole Axis powers.

As the Pacific Campaign of WWII was taking shape, the Japanese global strategy for resource procurement insisted on open sea-lanes. In 1940, previous embargoes set

¹ Raymond Goldsmith, *The Power of Victory: Munitions Output in World War II*, 71.

² Ibid., 73.

³ Richard Overly, *Why the Allies Won*, 5

⁴ Ibid.

forth by the United States had Japan searching for alternative sources of raw materials. By September 1941, the predicament was deepening as the Imperial Japanese Navy (IJN) was burning 2,900 barrels of oil every hour and reserves had dropped to 50 million barrels⁵. This dilemma forced Japan to choose war, but magnanimous plans resisted the destruction of U.S. oil facilities during the Pearl Harbor raid. IJN strategy dictated the attack of war ships and plans were drawn out to abide to that doctrine; however, the IJN would never again be in a position to deliver such a mortal blow to the US fleet⁶. Arguably, the force multiplier in the defeat of the Japanese fleet was the unmanageable pursuit of oil and the resultant mismanagement of oil using resources certainly halted the Japanese conquest of the Pacific Rim. During this same period the Allied forces made a science of efficiently expanding its supply chain westward across the Pacific. Each island captured by the Allies became a supply point to support further action. This ever-expanding logistical support was directly responsible for the ability of the Allied forces to push the Japanese from their island strongholds and make a steady approach towards mainland Japan.

A landmark military transportation and logistical event occurred after the close of WWII and is argued as the first major crises of the Cold War. After WWII, Germany was occupied by four nations. An infuriated Soviet Union viewed Germany as a platform to proliferate communism. In December of 1947, diplomatic meetings were suspended indefinitely because a consensus on unifying Germany could not be reached. By March of 1948, Soviets were inspecting trains entering their sector of Berlin for proper permits, which resulted in an airlift of supplies intending to placate the blockade. After the implementation of the deutsche mark and with no due regard for the civilian population, the Soviets tightened restrictions to include all ground transportation. The resulting Allied logistics action, to support the people of Berlin, delivered an overwhelming

⁵ Patrick Donovan, *Oil Logistics in the Pacific War*, Air Force Journal of Logistics, Spring 2004; 32.

⁶ Ibid., 34.

2,326,406 tons of supplies through 278,228 flights and a lifted blockade. This operation illustrated that, by logistically supporting a beleaguered population, political and military interests can be secured⁷.

The success of the coalition forces during Operation Desert Shield/Desert Storm (ODS/DS) was built upon an extensive logistic effort. Only by massing a huge amount of troops, equipment, supplies, and support elements in a relatively short amount of time were the coalition forces able to use an overwhelming force to drive the Iraqi forces from Kuwait. Within just one hundred hours of the coalition ground campaign a cease fire was declared as Kuwait had been liberated and the Iraqi forces destroyed or on the run. While it is recognized that this success was directly dependent on the massive supporting logistical efforts, one could argue these results were borne more from sheer force than by design. The logistic build up for ODS/DS exposed the inadequate ability of the U.S. forces to be mobilized and deployed via the United States Transportation Command's (USTRANSCOM) existing Air Mobility Command, (AMC) and Military Sealift Command, (MSC) capabilities. While the end result was deemed a logistical success, it was not achieved easily.

These few examples are landmarks occasions of logistics and illustrate the evolution of logistics through the ages. Arguing whether the transformations occurred solely through technology intervention or human innovation is not within the scope of this project; however the arguing of the logistics lessons in war winning have been examined.

⁷ Gregory C Tine, *Berlin Airlift: Logistics, Humanitarian Aid, and Strategic Success*, Army Logistician, Sept/Oct 2005; 41.

IV. CONCEPTS, PROCESSES AND METHODS

To support the National Security Strategy promulgated by future Presidents, a complete understanding of military logistics is valuable. The primary concept of military logistics is to get equipment to the warfighter when it is needed. Having a basic understanding of concepts, processes, and methods supports the US grand strategy and integration at the tactical, strategic, or operational level. Importance is impacted by personal experience and influenced by personal cultures. Providing an all inclusive list of logistical concepts is beyond the scope of this project; however, our opinions of impacting scholarly concepts and processes are compiled.

A primary concept for discussion is the integration of commercial enterprises within the DoD. In order to smooth the long-term, non-ownership types of relationships that have grown in number and importance within the realm of business-to-business transactions, the DoD must engage all involved parties. It should be noted that in actual business practice, firms are adopting programs that seek to develop closer relationships in order to achieve lower product costs, reduce time-to-market, improve quality, advance technology, or improve service and delivery.

The DoD must be willing to react or counter the competition between firms in order meet objectives. As businesses move toward a relational perspective with their suppliers and customers, commercial enterprises and DoD may find those relationships to be costly with marginal benefits. Logisticians must provide managers and leaders with more specific criteria for studying and interpreting specific relationships, allowing them the ability to assess relationships using the criteria suggested. Therefore, the DoD will be better able to differentiate when partnerships or alliances truly exist between suppliers and customers.

Included in the DoD integration of commercial enterprises is the addition of third party logistic shippers. 3PL enterprises contribute better supply chain visibility, cheaper costs and cycle time reductions solving general, but complex, transit issues. As the Defense Logistics Agency (DLA) and the US Transportation Command (TRANSCOM)

transform, an extensive use of commercial solutions to a complex supply and logistics challenge becomes apparent. The sheer volume of the DoD orders necessitates 3PL providers enter a previously closed defense logistics market. This volume, coupled with the need for greater asset visibility and efficiency, drives the need for better supply chain solutions and 3PL providers are in position for opportunities that are likely to emerge in the near future.

During the ongoing prosecution of the Global War on Terrorism (GWOT), a potential surge in future global terrorist attacks increases the likelihood for supply chain disturbances. Realizing transportation and supply chain integrity demands robust capabilities, future developments in transportation technology and how they may benefit the Defense Transportation System (DTS) are combined to increase the proactive security of goods and services. More efficient just-in-time truck deliveries utilizing GPS-based truck tracking, dedicated truck lanes, hybrid powered trains or more sophisticated diesel engines, and cargo carriers upgrading to the new A380 aircraft are a few examples of future developments explored⁸. Essentially any technological improvements in shipping, air carriers, and the trucking industry have the potential to benefit DTS as well. Additionally, justification of IT technologies and the timely and accurate transmission and dissemination of information is also important to the Logistician. Automatic replenishment programs (ARPs) represent a type of inventory management designed to improve efficiency across the supply chain⁹. A DoD majority ARP is Vendor Managed Inventory and the inherent information sharing of a VMI partnership raises a number of issues. Without contractual specificity, DoD and commercial enterprises may disagree on different incentives and performance measures that exist between the vendor and the customer¹⁰. Specifically, VMIs potential advantages and pitfalls focus mainly on what happens when inaccurate or untimely information is passed and used for decision making

⁸ Dr. Kent N. Gourdin, *Future Developments in Transportation*, Defense Transportation Journal, Aug 2005; 5.

⁹ Angulo, Nachtmann & Waller, *Supply Chain Information Sharing in a Vendor Managed Inventory Partnership*, Journal of business Logistics, Vol. 25, No.1, 2004, 101

¹⁰ Angulo, Nachtmann & Waller, *Supply Chain Information Sharing in a Vendor Managed Inventory Partnership*, Journal of business Logistics, Vol. 25, No.1, 2004, 101

and these inaccuracies are very expensive in the end. VMI is a complex system demanding major training initiatives so thorough auditing and verification of information can occur. Speed and accuracy of information can easily be applied to multitudes of Department of Defense programs and initiatives, be it through an acquisition process or for fulfilling the consumables necessities of soldiers in the field.

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V. LOGISTIC CONSIDERATIONS FOR SYSTEM ACQUISITIONS

Logistics is a life cycle process that must be applied with continuous emphasis and focus on reliability, maintainability, and operational availability. The ultimate ambition of logisticians should be maximum support of warfighters and stakeholders. The frequency of maintenance of a given item is dependant on reliability of that item, therefore reliability is the driver. The fix/repair syndrome demands a smooth material flow, distribution and life-cycle maintenance. The baseline linchpin for these requirements is reliability. Logistics support and the consequent support footprint are functions of reliability factors. Current reliability problems include mismanaged interaction or no collaboration between logistics and engineering program constituents. The logistics manager should be the proactive and outspoken supporter of an integrated logistics plan hinged on a 'crib to cradle' approach. In addition, the logistician should maintain that reliability advertisements, (i.e., MTBF, MTBM) are to be proven by the contractor versus the DoD. In a robust weapons systems program, reliability form and function are considered in actual application of maintainability factors. The collaboration of inherent reliability, characteristics of design, human systems integration and maintenance levels directly influence the warfighter's main objectives to maximize operational availability, sustain mission fulfillment and minimize life cycle costs. Because maintaining military equipment at its inherent reliability is a challenge, reliability factors are underpinnings to deployment and life cycle costs.

Actions to ensure utility as a knowledgeable, credible, and proactive logistics manager to any weapons system program should be outlined in the program's readiness goals. Of primary importance is knowledge of the program. Investing time learning the idiosyncrasies of the weapons systems and the program, to include emphasis on milestone dates, default thresholds, baseline deviations, budget concerns, and delivery dates is vital to the program's success. Concurrently, the logistician should devise and effectively communicate a logistics strategy plan implementing the program mission statements to promote maximum reliability, minimize maintenance factors, and minimize

cycle times. Bringing a new set of eyes to the program in itself may shed light on some issues that others may have unintentionally, or intentionally, neglected but a good logistics strategic plan will promote program goals. Specifically, the logistics plan should:

- Increase visibility and sensitivity to logistics issues
- Make budget expenditures efficient
- Improve overall customer service
- Reduce inventories through shorter cycle times
- Increase readiness via higher system reliability
- Reduce cycle times for administrative actions

Outcomes of the proactive plan include reduced ownership costs throughout the life cycle, increased retention through greater job satisfaction and increased likelihood for advancement. Logisticians should employ the value net to clarify the relationship among the team members, customers and stakeholders to balance solutions to program issues. The output from the model would assist in establishing long-term objectives.

A way to help ensure that the DoD is getting what it orders in regards to acquisition, while saving overall life cycle costs, is to add logistical concepts to the Test and Evaluation process. By building logistical metrics into the Test and Evaluation Master Plan (TEMP), the DoD invariably gains a more value added process of product testing.

The TEMP is the controlling document for the testing of a system and provides opportunities for logistics influence. During drafting of the TEMP, LT&E requirements should originate and required updates of the TEMP provide opportunities for the logistician to bring influence to bear with a particular emphasis on RMA. Logistic influences of the TEMP format include:

- Part I – during the system description the logistician must consider how the system will be supported and what the risks to reliability and maintainability are.
- Part II – during the program summary the logistician must know the T&E organization and keep the lines of communication open and should maintain when representative test articles are scheduled. The logistician should ensure that testing will verify maintainability and reliability.
- Part III – The critical technical characteristics should consider the complexity and inherent reliability of the proposed article versus supportability. The logistician should verify realized DT&E data so far and ask ‘how has logistics done so far?’ During any retesting, the logistician should take advantage of the opportunity for a logistics review.
- Part IV – OT&E outline calls for concurrent testing and the logistician’s main task is to ensure support is not compromised. The logistician should closely coordinate with the PM test coordinator to ensure adequate integration and testing of maintainability and reliability throughout the remainder of the test program and the rest of the TEMP.
- Part V – Test and Evaluation Resource Summary – This portion of the TEMP includes the test articles, test sites and instrumentation, test support equipment, threat systems, test targets, operational force test support, simulators, models and test beds, special requirements, T&E funding requirements, resources schedule and manpower and training requirements. The logistician should ensure the maintenance activities that are undertaken will be properly supported to ensure realism.

As the Logistics Manager, it will be of the utmost importance to get the other IPT members to consider the three main acquisition logistics caveats of reliability, maintainability, and supportability along with the more common drivers of cost, schedule, and performance. By “building in” these logistical items, overall performance will be improved. It should be noted though that “performance” in these terms means

more than just altitude, speed, and payload but also important concepts such as survivability, operational availability, and reductions in maintenance hours per unit of operation.

VI. FINANCIAL CONSIDERATIONS OF LOGISTICS SUPPORT

In an environment of ever-scarce resources combined with increasing missions and the ongoing GWOT the financial considerations of logistics are more important today than ever before. As the DoD presses forward aggressively with its transformation efforts to create an agile, flexible, integrated, and lethal joint military force, the logistics support operations must transform as well. Additionally, the DoD's efforts to transform its business processes directly affect logistics support as well as it becomes increasingly important to conduct fiscal business as efficiently and effectively as possible.

The driving forces that have a direct impact on the financial aspects of logistics support include the annual defense budget, the 2005 Quadrennial Defense Review (QDR), and the President's Management Agenda objective to improve financial management in the federal government. There are several financial management processes that can be considered for logistics support activities including those already used within DoD and other civilian processes that have yet to be adopted by DoD.

A Working Capital Fund (WCF) is used within DoD by many purchase and repair activities in order to account for costs and revenues in much the same manner as a commercial business. In theory, the desired result of a business entity utilizing a WCF is a service rate charged to its customers that accurately captures its total expenses in providing that service. This should provide stabilized rates, workload standards, and workload allocations that create a better business-like relationship. The difficulty arises in the fact that business entities using a WCF are to operate at a break-even point where the revenues coming in closely match the associated expenses. This is sometimes difficult to achieve as rates have to be estimated and determined far in advance, thus any significant changes in any costs during the operational year can greatly affect the entity's actual cost of providing a service compared to their established rate¹¹.

¹¹ CDR Philip J. Candreva, ed., *Practical Financial Management: A Handbook for the Defense Department Financial Manager*, 91-94.

Prime Vendor Support (PVS) is another area of utilizing commercial logistics practices that DoD has explored. PVS is simply using commercial logistics practices within the DoD to reduce operating costs while simultaneously improving readiness by contracting out complete support of weapons systems. One example of a large-scale PVS initiative was an Integrated Readiness Support Teaming Program, which explored the possibility of having Boeing manage the complete logistics support for the F/A-18E/F aircraft independently from DoD¹². Another similar potential area of merging commercial support with DoD is the use of Third-Party Logistics (3PL) to apply commercial logistics solutions to the complex supply and logistics challenges within DoD.

In several areas of logistics support, the DoD has designated an Executive Agent (EA) as the lead or sole entity responsible for providing support of specific logistic items within DoD. A prime example is the designation of the Defense Logistics Agency (DLA) as the EA for the commodities of bulk fuel, subsistence, and medical materials. The results of having a designated EA is a single agency that can better address logistic issues and a sole customer point of contact¹³.

Other commercial business processes that may provide benefits to the world of DoD logistics support include improving business-to-business relationships with customers and/or suppliers, conducting a full cost-benefit analysis that includes the time value of money before committing funds to any investment, and taking clues from commercial enterprises to reduce costs from reduced material handling time and improved customer service. Most advancements in the logistics field from improving tracking and in-transit visibility (ITV) by utilizing GPS and Radio Frequency Identification (RFID) systems to reducing shipping and storage costs by implementing foldable shipping containers as potential to save money and improve logistics support within DoD.

¹² Inspector General Department of Defense, *Logistics: F/A18-E/F Integrated Readiness Support Teaming Program*, Aug 2003, 1-2.

¹³ COL Dennis M. Crimiel, and COL Karen W. Currie, *Logistics Executive Agents: Enhancing Support to the Joint Warfighter*, Air Force Journal of Logistics, Fall 2005; 29, 3/4; Military Module, 14-27.

VII. CONCLUSIONS

By searching and screening a vast amount of logistical sources, the following annotated bibliography was created in order to provide a useful resource to students and faculty in this field. The articles addressed are considered professional documents that stood out during our research as providing the most promise as being useful to the DoD logistics community. This is by no means meant to be an all-inclusive list, but rather a starting point of a “body of knowledge” that can be added to and edited over time.

The summation of articles that follows is arranged according to the four major themes outlined in this project’s methodology section. This is intended to aid the user in referencing specific subject matter items, while finding additional items of interest in other related areas. A brief synopsis of each article is provided to describe the main ideas, along with a full bibliography reference in order to access the full article, website, or journal.

Overall, this MBA project has correctly shown that there are tremendously intricate issues that face, and will continue to face, the military logistical planner. These issues are not merely isolated to supplying the battlefield or afloat forces. Logistical parameters must become more prevalent in the DoD systems acquisition phases as well. Concepts of overall operational availability and suitability must be considered, along with those of equipment and troop maintainability and supportability. In the future, technology will greatly assist logistical planners in all of these spheres as greater amounts of information sharing and process streamlining reduces errors and increases efficiency.

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ANNOTATED BIBLIOGRAPHY

A. LOGISTICS LESSONS LEARNED BY LIEUTENANT GRANT IN MEXICO

Kevin J. Dougherty
Army Logistician; Jan/Feb 2003; 35, 1; Military Module
P. 34

Another historical article, this piece focuses on how prior operational and logistical experiences can help operators and decision makers in future scenarios. General Grant's quartermaster experiences during the Mexican War of 1846-1848 are described as innovative logistical tactics for their time. The concept of forces operating devoid of rear supply bases and essentially living off the land, otherwise known as foraging, is discussed. This article shows the reader how even in historical battles, innovation, and "thinking outside the box" when it comes to logistics can be beneficial. Later in the article, Grant's application of what he learned in Mexico during the battle of Vicksburg is discussed.

B. LOGISTICS AND LEE'S ANTIETAM CAMPAIGN

William T. Gillespie Jr.
Army Logistician; Jan/Feb 2003; 35, 1; Military Module
P. 37

This brief but informative article shows how important logistical issues were during key campaigns of the Civil War. Antietam, the South's first real offensive maneuver into the Union territory, was mainly an attempt to derail the North's logistics and Line of Communication pipelines while augmenting their own. The inherent disadvantages suffered by the South concerning supply, industry, and infrastructure are mentioned. The author also describes how it was imperative that the South do its best to protect vital supply lines while attempting to seize more by attacking weakly defended Union supply installations in the North. This article distinguishes itself by exploring how non-frontline combat and strategic activities can generate huge consequences to overall efforts.

C. THE DEFEAT OF THE SOUTH, RAILROADS AND WAGONS

Robin Higham

Air Force Journal of Logistics; Spring 2005; 29, 1; Military Module

P. 30

Higham's article briefly describes the trials of the Confederate Army when it came to overland logistics. The reader is introduced to the multiple problems in rail infrastructure during that period; multiple rail gauges, insufficient and weak track, ineffective and faulty rolling stock, a lack of warehousing facilities, and poor management. The need for thoughtful and clear tactics and wartime doctrine is also explored, namely the foolish practice of the Southern generals of the time of burning and destroying captured railway equipment and track. This equipment could have been easily used to support Southern objectives. The reader is also briefly shown the necessity of proper maintenance support during combat operations. In this case, the South did a horrible job maintaining existing, but insufficient, railroad equipment and horse-drawn wagons resulting in huge amounts of waste.

D. BERLIN AIRLIFT: LOGISTICS, HUMANITARIAN AID AND STRATEGIC SUCCESS

Gregory C. Tine

Army Logistician; Sep/Oct 2005; 37,5; Military Module

P. 39

The article recounts the gargantuan undertaking after the division of post World War II Berlin. In June of 1948, Great Britain, France, and the United States establish currency reform; the Soviets regard this action as a provocation and suspend rail and highway traffic into and out of Berlin. Over the course of the next 15 months, the remaining Allies banded together to support the two million Berlin citizens through a logistical marvel known as the Berlin Airlift. Food, fuel, and private donations began pouring into Berlin. By the end of the operation, 278,228 flights had delivered 2,326,406 tons of supplies and ended the Soviet blockade. The airlift changed the way modern warfare was fought by showing that logistically supporting a beleaguered population, political and military interests can be secured.

E. OIL LOGISTICS IN THE PACIFIC WAR

Patrick H Donovan

Air Force Journal of Logistics; Spring 2004; 28, 1; Military Module

P. 28

The article recounts the mistakes made by the Japanese during the Pacific War of WWII. Mistakes made by the IJN planners arguably decided the fate of the Imperial Navy and the end of the Japanese Empire revolved solely around the logistics of oil. The authors redefine tactics and strategy that could have changed the shape of the world today showing how Germany effectively targeted oil lines but Japan chose a different plan. From pre-war days, through the bombing of Pearl Harbor and into the U-boat campaign, the authors succinctly illustrate logistical mistakes.

F. AN ANALYSIS OF THE FACTORS AFFECTING THE NET OPERATING RESULT AT NAVAL AVIATION DEPOT CHERRY POINT, NORTH CAROLINA

Scott Griffith

Naval Postgraduate School Thesis; December 2002

By explaining the existing manner of establishing stabilized rates for the Naval Aviation Depot (NADEP) Cherry Point, North Carolina, this thesis evaluates current data to provide an understanding of the process of creating stabilized rates, workload standards, and workload allocations. Through analysis of the rate setting inputs it attempts to determine which has the greatest influence on the financial operating result. A variance analysis of existing methods indicates workload standards routinely underestimate the number of hours required to complete the work. To establish which input variable has the most influence on the net operating result at the NADEP, the author conducted a sensitivity analysis that concludes changes to the workload norms have the most influence.

G. AN ASSESSMENT OF SUPPLIER – CUSTOMER RELATIONSHIPS

Lloyd M Rhinehart; James A Eckert; Thomas J Page Jr.; Thomas Atkin
Journal of Business Logistics; 2004; 25,1; ABI/INFORM Global
P. 25

The focus of this paper is the study of long-term, non-ownership types of relationships that have grown in number and importance within the realm of business-to-business transactions. Noting that in actual business practice, firms are adopting programs that seek to develop closer relationships in order to achieve lower product costs, reduce time-to-market, improved quality, advanced technology, or improved service/delivery. As businesses move toward a relational perspective with their suppliers and/or customers, they may find those relationships to be costly and the relationship may not produce the promised benefits. This paper provides managers and academics with more specific criteria for studying and interpreting specific relationships allowing them the ability to assess relationships using the criteria suggested, and thus will be better able to differentiate when Partnerships or Alliances truly exist between suppliers and customers.

H. AN ANALYSIS OF THE AIR FORCE WORKING CAPITAL FUND'S PERFORMANCE AND THE PRICING STRATEGY OF THE MATERIEL SUPPORT DIVISION

Lisa Stanley
Air Force Institute of Technology Thesis; March 2003

The Air Force Working Capital Fund (AFWCF) is a revolving fund established to create a more business-like relationship between the Air Force and its customers. The AFWCF is used for several divisions providing depot level repairs, supplies and inventory, information technology, and transportation services to military customers. Ideally, the AFWCF should operate at a break-even point where it generates just enough revenue to cover its expenses. In reality, there is either a surplus that must go back into the AFWCF or there is a deficit that must be made up the following year. The focus of this paper is to identify the key factors that prevent the AFWCF from operating at a break-even point by analyzing its past performance. It also evaluates the pricing strategy

of the Materiel Support Division based on commercial best practices to determine if its pricing methods support the AFWCF meeting its goals.

I. ANALYZING FORCE PROJECTION AND DEFENSE TRANSPORTATION SYSTEM INVESTMENT OPTIONS FOR THE 21ST CENTURY

Peter S Lennon

Defense Transportation Journal; Aug 2000; 56,4; Military Module

P. 20

According to the author, the joint transportation community has lacked the ability to perform transportation investment analysis in a coordinated and comprehensive manner. He recommends three major actions that should be taken to revamp and improve the transportation procurement and operational analysis tool kit:

1. Integrate cost assessment tools directly into the deployment modeling “suite”.
2. Ensure that end-users of the analytical data are active in the creation of the modeling suite, selections of the operational and analytical parameters surrounding its usage, and interpretation of its outputs.
3. Initiate a process to forecast and model the characteristics and algorithms of the future transportation environment.

The information in this article is slightly dated as it was published prior to the war on terror and the defense transformation efforts.

J. APACHE PRIME VENDOR SUPPORT (PVS): A CASE STUDY OF IMPLEMENTING THE PVS INITIATIVE WORLD WIDE IN SUPPORT OF THE AH-64 APACHE HELICOPTER

Richard Williams

Naval Postgraduate School Thesis; September 2000

Through analysis of the capabilities and responsiveness of the Army’s Prime Vendor Support (PVS) proposal of the operational readiness rate of the AH-64 Apache Attack Helicopter this thesis evaluates the PVS proposal through sustainability aspects, system upgrade capability, and the overall life cycle cost. The goal of PVS is to use the best commercial logistics practices to reduce operating costs while improving readiness

by contracting out the wholesale support of a weapons system and creating a single accountable entity. The author looks at the application of PVS on the Apache program and the Navy's Performance Based Logistics (PBL) resulting in the identification of the life-cycle cost benefits, the logistical life-cycle systems impacts, contractual issues, and lessons learned. This thesis provides lessons learned that can be used by future programs that are considering using a PVS system.

K. DEFENSE WORKING CAPITAL FUND

June Taylor

Air Force Journal of Logistics; Winter 2001; 25, 4; Military Module

P. 24

The Defense Working Capital Fund (DWCF) was created so the federal government purchase and repair activities could account for costs and revenue similar to a commercial business. The author suggests improvements in the way DWCF is used for maintenance and supply by evaluating which DWCF policies need to be revised to provide the most efficient and effective use as possible. The use of the DWCF should allow an activity to quantify its value-added to the organization, understand the true cost of a product or service, and provide information for a make-or-buy decision. Several initiatives are presented that have the potential to revitalize the DWCF through obtaining better control of the depot and supply budgeting and management processes.

L. F/A-18E/F INTEGRATED READINESS SUPPORT TEAMING PROGRAM

Robert West; Henry Kleinknecht

Department of Defense Office of the Inspector General report; August 2003

This Inspector General of the Department of Defense (DoD-IG) report discusses a Navy initiative to have the Boeing Company independently manage the total logistics support program for the F/A-18E/F aircraft. The Naval Air Systems Command prepared a business case analysis indicating there would be a cost avoidance derived from partnering with commercial industry for total logistics support of the F/A-18E/F aircraft. Lacking sufficient funding for the project, Naval Air Systems Command asked the Naval Inventory Control Point, Philadelphia (NAVICP) to provide assistance through the Navy

Working Capital Fund (WCF). NAVICP conducted a second business case study which still indicated a savings, but less than the first analysis. The DoD-IG evaluated both business case analysis and determined both were flawed and there was no actual cost savings by partnering with Boeing. This report could be beneficial for lessons learned for other logistics programs considering using a WCF.

M. FOLDABLE CONTAINERS TO REDUCE THE COSTS OF EMPTY TRANSPORT? A COST-BENEFIT ANALYSIS FROM A CHAIN AND MULTI-ACTOR PERSPECTIVE

Rob Konings

Maritime Economics and Logistics; 2005; 7

P. 223

The movement of empty shipping containers is unavoidable, unproductive, and costly. Through a cost-benefit analysis of four different logistic concepts this article evaluates the feasibility of using foldable shipping containers to reduce shipping costs, transshipment costs, and storage costs of commercial shipping. The use of foldable containers may provide a means to reduce these costs. The implications exist for the Department of Defense (DoD) to reduce the same costs by using this technology.

N. A FRAMEWORK FOR UNDERSTANDING THE INTERACTION OF UNCERTAINTY AND INFORMATION SYSTEMS ON SUPPLY CHAINS

Edmund Prater

International Journal of Physical Distribution & Logistics Management; 2005; 35, 7/8; ABI/INFORM Global

P. 524

In order to understand the different types of uncertainty that can affect supply chains and their accompanying information systems (IS) the author provides a framework to allow researchers and practitioners the ability to more accurately discuss the exact problems they may have in the management of supply chains and the tools required to address these problems. This framework includes four macro-level uncertainties for managers to focus on general roles and relationships which are further defined with detail

micro-level uncertainties that must be dealt with when managing supply chains and dealing with IS. Finally, each subcategory of uncertainty includes methods for managers to deal with that specific uncertainty.

O. FUTURE DEVELOPMENTS IN TRANSPORTATION

Kent Gourdin

Defense Transportation Journal; Aug 2005; 61,4; Military Module

P. 5

The editor of the Defense Transportation Journal provides a short review of future developments in transportation technology and how they may benefit the Defense Transportation System (DTS). More efficient just-in-time truck deliveries utilizing GPS-based truck tracking, dedicated truck lanes, hybrid powered trains or more sophisticated diesel engines, and cargo carriers upgrading to the new A380 aircraft are a few examples of future developments explored. Essentially any technological improvements in shipping, air carriers, and the trucking industry have the potential to benefit DTS as well.

P. JUST IN TIME AT DOD A CHANGING MARKETPLACE FOR 3PL SERVICE PROVIDERS

Kevin Speers; Stephen Eisele; Joshua Pavluk

Defense Transportation Journal; Jun 2006; 62,3; Military Module

P. 20

Logistics support operations have not kept up with the efficiency and effectiveness of the more integrated, joint military forces according to the authors. As the Defense Logistics Agency (DLA) and the US Transportation Command (TRANSCOM) transform, an extensive use of commercial solutions to a complex supply and logistics challenge becomes apparent. According to the authors, third-party logistics (3PL) providers are eager to enter the defense logistics market. Coupled with the need for greater asset visibility and efficiency, which drives the need for better supply chain solutions, 3PL providers are in position for opportunities that are likely to emerge in the near future.

Q. LOGISTICS EXECUTIVE AGENTS: ENHANCING SUPPORT TO THE JOINT WARFIGHTER

Dennis Crimiel; Karen Currie

Air Force Journal of Logistics; Fall 2005; 29, 3/4; Military Module

P. 14

In order to support a military that is transforming to become a more flexible, agile, responsible, and lethal force, the logistics support must transform as well. According to the authors, many lessons learned from the first Gulf war were still issues during Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF). DOD has officially designated the Defense Logistics Agency (DLA) as the Executive Agent (EA) for the commodities of bulk fuel, subsistence, and medical materiel. By designating an EA for these commodities improvements are expected to be made in four areas of concerns: addressing gaps in the supply chain due to service-unique stovepipes; limited collaborative planning; lack of a controlling element for end-to-end distribution; and lack of in-transit visibility (ITV). Additionally, the EAs will provide a single point of contact, which should improve customer satisfaction.

R. LOGISTICS INVESTMENT OPPORTUNITIES: ASSESSMENT OF PROGRAM COSTS AND BENEFITS

Stephen Russell

Air Force Journal of Logistics; Fall 2003; 27, 3; Military Module

P. 22

Traditional means of economic analysis are still being used in the Department of Defense (DoD) mainly because these decision rules are simple and straightforward. According to the author, these methods are fundamentally faulty because they do not take into account the time value of money. When logistic decisions are based on assessing alternative strategies or courses of action for accepting or rejecting an investment opportunity an economic analysis of the upfront costs against the future benefits (or cost avoidance) must be made. The Government's cost of capital must be taken into consideration by discounting time-distributed costs and benefits. This article presents six alternative approaches to economic analysis of logistics investments: payback, naïve rate of return, average rate of return, internal rate of return, net present value, and benefits and

cost ratio. Each method is evaluated based on its nature, merits, and shortcomings with particular emphasis on whether or not the time-value-of-money is incorporated in the decision rule.

S. REDUCING COSTS THROUGH IMPROVED RETURNS PROCESSING

Julie Stuart; Winston Bonawi-tan; Susan Loehr; Joyce Gates
International Journal of Physical Distribution & Logistics Management; 2005; 35, 7/8;
ABI/INFORM Global
P. 468

By analyzing a fashion catalog distributor's current returns process the authors propose a new algorithm for improving returns in the apparel business. By implementing the new algorithm, costs are reduced, the time required to handle returns is reduced, and simultaneously customer service on back-ordered items is improved all by reducing the number of workstations required and the amount of materiel handling required to process each return. There may be some potential for similar improvements in defense logistics depending on the existing returns procedures in the current logistics system being considered.

T. SUSTAINMENT OF ARMY FORCES IN OPERATION IRAQI FREEDOM. BATTLEFIELD LOGISTICS AND EFFECTS ON OPERATIONS

Eric Peltz; John Halliday; Marc Robbins; Kenneth Girardini
RAND Corporation; 2005

This RAND report evaluates the performance of support for the sustainment of materiel of Army forces during Operation Iraqi Freedom (OIF). It looks at the effects of this sustainment support on operations particularly from the start of ground operations to the fall of Baghdad. The results of this report have "implications for the design of the logistics system, logistics process improvement efforts..., as well as logistics enablers such as information systems that provide logistics situational awareness." It emphasizes the importance of understanding how logistic issues can effect operations and how determining the underlying causes of these problems will govern future improvements in logistics.

U. THE ROLE OF STANDARDS IN REALIZATION OF INTEGRATED LOGISTICS SUPPORT ON A NATIONAL LEVEL

Rados Popadic

Logistics Spectrum; Oct-Dec 2003; 37,4; Military Module

P. 27

This article is a synopsis of a professional paper presented at SOLE's International Logistics Conference in 2003. The many benefits of IT technology in the Logistics and Supply Chain world are described, with a focus on attempting an overall standardization. This standardization, either within the same organizational entity or between entities working together for a common goal, is designed in order to promote efficiency and to reduce product and procedural variables. The CALS system is the main standardization practice discussed, a DoD initiative that the private sector is seeking to emulate. Standardization practices are discussed in multiple facets, including product procurement, engineering, and logistics support.

V. TRANSFORMATION IMPLICATIONS OF SEA BASING FOR COMMERCIAL SHIPPING

Stephen Carmel

Defense Transportation Journal; Feb 2004; 60, 1; Military Module

P. 18

This article provides the reader a general conceptual basis of the Navy's Sea Basing initiatives. A network and system's view of the concept is repetitiously mentioned, often calling Sea Basing a "system of systems." The necessity for accurate prediction of materials needed in the new types of warfare encountered is discussed, focusing on SLRC concepts. This is especially crucial due to the ultimate goal of reduced logistical footprint with increased flexibility. The interface between DoD and commercial entities is another key point of the article, creating a viable discussion topic of how to successfully integrate DoD maritime assets with commercial platforms who carry both commercial and military goods during times of conflict.

W. DOD'S SUPPLY CHAIN MANDATE: FROM FACTORY TO FOXHOLE

Roger Kallock; Lisa Williams

Supply Chain Management review May/Jun 2004; 8, 4; ABI/INFORM Global

P. 46

This article chronicles the rapid evolution of U.S. military logistics activities in recent years and describes increasing collaboration between logistics operations in the armed services. The lessons learned about agile and adaptive nonlinear supply chain disciplines will make a difference to future combat scenarios. This document's value added basis relies heavily on its universal application to the military.

X. DESIGNING AND MANAGING MULTIPLE PIPELINES

James Aitken; Paul Childerhouse; Martin Christopher; Dennis Towell

Journal of Business Logistics; 2005; 26, 2; ABI/INFORM Global

P. 73

This Journal of Business Logistics article provides the reader general definitions of modern key logistical terminology such as Lean and Agile. There is a discussion regarding the tendency of firms to create more "supply-centric" supply chain designs instead of the more useful and efficient "customer-centric" models. This discussion is supplemented by examples of what are described as "Order Winners" and "Market Qualifiers" in today's environment. Factors such as lead time, cost, and reliability are mentioned as determinants of the type of supply chain required for firms. A model is then employed, the "Supply Chain Availability Fulcrum," that concisely reaffirms these topics over a product's specific lifecycle, for they are dynamic throughout.

Y. IMPROVING THE MANAGEMENT OF RELIABILITY

Donald Eaton

Naval Postgraduate School Working Paper Series; August 2004

The author shows how an improper balance of reliability and maintainability blend to become a management nightmare. The DoD and the Navy are struggling with the results of the imbalance of poor inherent reliability of components on the one hand, and the consequences of highly exaggerated reliability figures of merit used for life cycle

support planning on the other. Also, plenty of qualitative logistical equations are outlined without inundating the reader with too much technical jargon.

Z. SUPPLY CHAIN INFORMATION SHARING IN A VENDOR MANAGED INVENTORY PARTNERSHIP

Andres Angulo; Heather Nachtmann; Matthew Waller
Journal of Business Logistics; 2004; 25, 1; ABI/INFORM Global
P. 101

This Journal of Business Logistics article provides the reader further justification of why IT technologies and the timely and accurate transmission and dissemination is so important to the Logistician. Automatic replenishment programs (ARPs) are presented including CRP, ECR, QR, and VMI. Vendor managed inventory information sharing and its potential advantages and pitfalls are shown, focusing mainly on what happens when inaccurate or untimely information is passed and used for decision making. These inaccuracies are very expensive in the end. Thorough auditing and verification of information is recommended. Speed and accuracy of information can easily be applied to multitudes of Department of Defense programs and initiatives, be it through and acquisition process or for fulfilling the consumables necessities of soldiers in the field.

AA. INVENTORY CONSIDERATIONS IN NETWORK DESIGN

Keely Croxton; Walter Zinn
Journal of Business Logistics; 2005; 26, 1; ABI/INFORM Global
P. 149

This article attempts to create a working model of how to include inventory costs when optimizing supply network design. Principles of safety stock and economic order quantity (EOQ) are discussed, along with the financial tradeoffs between warehousing and transportation costs. The Portfolio Effect is presented as a preferred estimation of safety stock savings as opposed to the Square Root Law. This article is presented as a catalyst for further research of a more quantitative manner. Department of Defense supply centers may find it of some use when determining how to further streamline processes.

AB. MEASUREMENT ISSUES IN PBL

Kenneth Doerr; Ira Lewis; Donald Eaton
Journal of Public Procurement; 2005

The article establishes a structural framework upon which measurement issues can be developed and upon that framework the author's develop questions about how measurement informs which candidates are PBL suited. Also, propositions for determining risk during the decision to outsource and finally the author's discuss how measurement issues should be considered in the management of ongoing PBL contracts.

AC. OUTSOURCING: ASSESSING THE RISKS AND BENEFITS FOR ORGANIZATIONS, SECTORS AND NATIONS

Christine Harland; Louise Knight; Richard Lamming; Helen Walker
International Journal of Operations & Production Management; 2005; 25, 9/10;
ABI/INFORM Global
P. 831

This article aims to holistically assess risks and benefits associated with outsourcing. It provides a framework for managers considering outsourcing and contributes to knowledge on understanding outsourcing at different system levels. Deductions of everyday outsourcing effects in nations and sectors are researched and the article alludes to subsequent ramifications.

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